Application No.: 10/751,328   9   Docket No.: 590282001100

REMARKS

Claims 1-34 were pending in the present application. By virtue of this response, Claims 1, 16, and 25 have been cancelled, Claims 2, 5, 6, 9-15, 17, 19, 21-24, 26, and 32-34 amended and new Claims 35-36 added. Accordingly, Claims 2-15, 17-24, and 26-36 are currently under consideration. Amendment or cancellation of certain claims is not to be construed as a dedication to the public of any of the subject matter of the claims as previously presented.

Claim Rejections-35 USC §101

Claims 1-23 and 33 stand rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim Rejections-35 USC §103(a)

Claims 1, 6-11, 13, 23, 24, 27, 28, 29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cornish et al. (herein after "Cornish", *"View-Dependent Particles for Interactive Non-Photorealistic rendering"*).

Claims 2, 25 and 34 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cornish et al. (hereinafter "Cornish", *"View-Dependent Particles for Interactive Non-Photorealistic rendering"*).

Claims 12 and 31 stand rejected under 35 U.S.C. 1039a) as being unpatentable over Cornish in view of Kumar et al. (hereinafter "Kumar", *"The SunSaver: An OpenGL Visualization of the Sun's Surface"*).

Claims 14 and 15 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cornish in view of van Wijk (*"Rendering Surface-Particles"*).

Claims 16-18 and 30 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cornish in view of Blinn (US Patent 6,184,891).

pa-1125657

Claims 3, 5, 20-22 and 26 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Cornish in view of Blinn in further view of Klassen (US Patent 6,591,020).

Claim Objections

Claim 19 was objected to as being dependent upon a rejected base claim, but indicated as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

In response, Claim 19 is rewritten to include the subject matter of base Claim 16, thus making Claim 19 allowable, along with now dependent Claims 17, 18, and 20-22, and also Claim 19 is amended to overcome the §101 rejection, see below.

Response to Rejections

In light of the rejections, the claims have been amended to read more closely on the system of Fig. 1 and a process in accordance with this system. This is described in the specification at paragraphs 15 to 18. It is respectfully submitted that no such system, nor such a process, are shown in any of the references, alone or in combination. As pointed out in paragraph 15, the scene description 110 of Fig. 1 includes a number of objects. Some objects may be modeled as geometric objects and others as particle systems. Accordingly, the information about the geometric objects from the scene description 110 is passed to the geometry renderer 120. The information about the particle systems from the scene description 110 is passed to the particle renderer 140.

Then as pointed out in paragraph 16, the geometry renderer 120 creates an image 125, which is a geometric (geometry) image of the geometry-modeled objects in the scene. As pointed out in paragraph 17, in addition to the geometry image 125, the geometry renderer 120 generates a depth map 130 of the image 125. As pointed out, the depth map 130 includes a two-dimensional array of depth values, each depth value corresponding to a distance from the camera to the nearest geometry object in the scene. The depth map 130 is passed to the cutout particle generator 135, which generates cutout particles which are passed to the particle renderer 140. These cutout particles are stored in the meantime in particle database 145. As pointed out in paragraph 118, the

pa-1125657

cutout particles occlude or subtract from the accumulated color and opacity of the particle system pixels.

Thus, when the particle renderer renders <u>both</u> the particle systems <u>and</u> the cutout particles together to generate the particle image 150, this includes the occlusion caused by any geometric objects that are in the geometric image 125, see paragraph 18. Thus the cutout particles (from the geometric objects) are used during the particle rendering process to perform depth resolution, since these cutout particles block portions of the particle system objects in the particle image 150. Then the compositor 155 composites together the geometric image and the particle image, which already includes some of the data from the geometric image, to form the composite image 160.

It is respectfully submitted that no such system or process is shown in the chief reference Cornish, or in Cornish even in combination with the other references.

As pointed out in the earlier response, Cornish uses only particle systems to animate or depict what he calls strokes, which are human-created drawing techniques using conventional (non-computer) media, such as charcoal or painting, or pen or pencil. See first paragraph, page 1, column 2 of Cornish.

Thus, Cornish merely makes use of <u>particle systems</u> to depict human-type artwork drawing. Cornish is <u>not</u> dealing with geometric objects, as opposed to particle systems. He uses particle systems as a single depiction technique to depict human artwork. A reference to geometry or geometric in Cornish appears in the Cornish Abstract line 2. However, there is no indication here that Cornish is working with geometric objects and particle systems. The Examiner also referred to Cornish section 1.1, lines 1-13 as referring to a geometric object. There appears to be no discussion in any other part of Cornish of geometry or geometric objects. The Examiner considers the Cornish cutout particles which are represented as strokes as being placed over a corresponding geometric polygon model. However Cornish here says that "View dependent particles provide an efficient multi-resolution structure for fine-grained control over the placement of strokes, and can be

pa-1125657

Application No.: 10/751,328   12   Docket No.: 590282001100

generated from any polygonal model." This means that the particles are generated from the geometric objects, according to the Examiner.

While in accordance with the present invention and present Fig. 1, the cutout particles are generated corresponding to the geometric objects, the geometric image is not otherwise transformed and remains a geometric based image. Hence the bifurcation in accordance with the present invention between the separately rendered geometric objects and the particle system objects is not present in Cornish, even considering the Examiner's reading of Cornish which is not conceded as being accurate.

Note that in accordance with present Fig. 1, the geometric objects remain geometric objects and are provided to the compositor 155 where they are combined with the separately rendered particle image. Further, the geometric objects are used to generate the cutout particles. The Examiner's reading of Cornish, even if _arguendo_ correct, indicates that instead _all_ of the geometric objects are rendered as particles or may overlay a polygonal surface. However a "surface" in Cornish is not an object and does not meet the claimed "geometric objects". Moreover, while Cornish refers to a "polygonal model", he does not indicate the joint use of a polygonal model and a particle system to be rendered together, as in accordance with the present invention.

It is respectfully submitted that the other cited references fail to remedy this deficiency in Cornish.

Claim Amendments

Applicant has canceled original method Claim 1 in favor of new method Claim 35 which recites much of the same subject matter of Claim 1, but reads more closely on Fig. 1, including the depth map and making clearer the use of the geometric objects to generate the cutout particles. The preamble of present Claim 35 is substantially similar to that of original Claim 1. However, Claim 35 recites in its body, first clause unlike Claim 1 and thereby reading more closely on Fig. 1, element 120 "rendering the geometric objects to generate a geometric image;".

pa-1125657

Application No.: 10/751,328   13   Docket No.: 590282001100

Further, Claim 1 now recites in its second clause an element earlier recited in Claim 2 which is "rendering the geometric objects to produce a depth map", thereby reading on element 130 in Fig. 1.

The next clause in Claim 35 recites, reading on Fig. 1, element 135, "generating a plurality of cutout particles from the depth map, each cutout particle corresponding to one of the geometric objects;".

The next clause of Claim 35 recites "rendering the particle systems with the cutout particles to generate a particle image..." which reads substantially on the second clause in the body of Claim 1.

The next clause in Claim 35 recites "compositing the particle image with a geometric image to create a composited image;" which is somewhat similar to the third clause in the body of Claim 1, but more closely reads on Fig. 1, element 155.

Further to overcome the §101 rejection (which is traversed but the claim is amended in order to expedite prosecution), the final clause of Claim 35 recites "displaying the composited image on a display." This final clause is added solely with regard to the §101 rejection.

Thus it is respectfully submitted that clearly Claim 1 does not read on Cornish and moreover is patentably distinguishable thereover.

Even given the Examiner's reading of Cornish as discussed above (and which is disputed), there is no indication (as pointed out in detail above) that Cornish discloses as in Claim 35 "compositing the particle image with a geometric image to create a composited image;" where further the particle image is generated using the cutout particles from the depth map and the depth map is produced from the geometric objects, as also recited in Claim 35.

Hence Claim 35 distinguishes over Cornish and is allowable, as are all claims dependent thereon. Note that claims originally dependent upon Claim 1 have been amended to conform to new

pa-1125657

Application No.: 10/751,328   14   Docket No.: 590282001100

base Claim 35 and to be dependent upon Claim 35. These are Claims 2-15 and 23 and 32. Hence each of these claims is allowable for at least the same reason as is the base claim.

As regards independent system Claim 24, this has also been amended to more closely read on Fig. 1 and effectively parallels new Claim 35. Claim 24 thus is allowable at least for the reasons as pointed out above with regard to Claim 35.

Hence the first clause in the body of Claim 24 recites "a geometry renderer that renders the geometric objects in the scene description to generate a geometric image and a depth map of the geometric objects;". This reads on Fig. 1, elements 120, 125, 130.

The next clause of Claim 24 recites "a cutout particle generator that generates a plurality of cutout particles from the depth map...". Again this reads on element 135 in Fig. 1.

The final clause of Claim 1 recites "a compositor...that combines the geometric image and the particle image to form a composited image." This reads on element 155 in Fig. 1.

It is respectfully submitted that no such system is even suggested in Cornish for the reasons pointed out above in connection with Claim 35, nor do the other references make good the deficiencies in Cornish and thereby Claim 24 is allowable. For instance, Cornish does not disclose or suggest two renderers as recited in Claim 24, one for each type of object, and also does not disclose using the geometry renderer to supply a depth map to the particle renderer, in accordance with Claim 24.

Claim 33 which earlier was independent has been amended to be dependent upon system Claim 24 and is allowable for at least the same reason as base Claim 24.

Claim 34 which earlier was independent has been amended to be dependent upon method Claim 35 and is allowable for at least the same reason as base Claim 35.

New Claim 36 is dependent upon Claim 35 and reads on the geometry renderer 120 and particle renderer 140 of Fig. 1, and is allowable for at least the same reason as base Claim 35.

pa-1125657

Application No.: 10/751,328   15   Docket No.: 590282001100

CONCLUSION

In view of the above, all presently pending claims in this application are believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below. This amendment is entitled to entry since it is accompanied by an RCE.

In the event the U.S. Patent and Trademark Office determines that an extension and/or other relief is required, Applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to **Deposit Account No. 03-1952** referencing Attorney Docket No. **590282001100**.

Dated: April 11, 2007   Respectfully submitted,

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pa-1125657